

FORM PTO-1390 (REV 11-98)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371			U.S. APPLICATION NO. (If known, see 37 CFR 1.5) <b>09/646101</b>
INTERNATIONAL APPLICATION NO. PCT/EP99/01668	INTERNATIONAL FILING DATE 13 March 1999	PRIORITY DATE CLAIMED 21 March 1998	
TITLE OF INVENTION UMBRELLA DEVICE			
APPLICANT(S) FOR DO/EO/US SOBEK, Werner; SCHULER, Mathias; BAUMULLER, Dominik			
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:			
<ol style="list-style-type: none"> <li>1. <input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. 371.</li> <li>2. <input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. 371.</li> <li>3. <input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).</li> <li>4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.</li> <li>5. <input type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau).</li> <li>b. <input type="checkbox"/> has been transmitted by the International Bureau.</li> <li>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</li> </ol> </li> <li>6. <input type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)).</li> <li>7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <ol style="list-style-type: none"> <li>a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau).</li> <li>b. <input type="checkbox"/> have been transmitted by the International Bureau.</li> <li>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</li> <li>d. <input type="checkbox"/> have not been made and will not be made.</li> </ol> </li> <li>8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</li> <li>9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</li> <li>10. <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</li> </ol>			
Items 11. to 16. below concern document(s) or information included:			
<ol style="list-style-type: none"> <li>11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</li> <li>12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</li> <li>13. <input checked="" type="checkbox"/> A <b>FIRST</b> preliminary amendment. <input type="checkbox"/> A <b>SECOND</b> or <b>SUBSEQUENT</b> preliminary amendment.</li> <li>14. <input type="checkbox"/> A substitute specification.</li> <li>15. <input type="checkbox"/> A change of power of attorney and/or address letter.</li> <li>16. <input checked="" type="checkbox"/> Other items or information: <ul style="list-style-type: none"> <li>- Published International Application WO 99/48399</li> <li>- English Translation of Published International Application WO 99/48399</li> <li>- International Preliminary Examination Report</li> <li>- English Translation of International Preliminary Examination Report</li> </ul> </li> </ol>			

09/646101

17. ☒ The following fees are submitted:**BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):**

Neither international preliminary examination fee (37 CFR 1.482)  
nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO  
and International Search Report not prepared by the EPO or JPO. .... \$970.00

International preliminary examination fee (37 CFR 1.482) not paid to  
USPTO but International Search Report prepared by the EPO or JPO ..... \$840.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO  
but international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$760.00

International preliminary examination fee paid to USPTO (37 CFR 1.482)  
but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... \$670.00

International preliminary examination fee paid to USPTO (37 CFR 1.482)  
and all claims satisfied provisions of PCT Article 33(1)-(4) ..... \$96.00

**ENTER APPROPRIATE BASIC FEE AMOUNT =****CALCULATIONS PTO USE ONLY**

\$ 840

\$ 130

Surcharge of \$130.00 for furnishing the oath or declaration later than ☐ 20 ☒ 30  
months from the earliest claimed priority date (37 CFR 1.492(e)).

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE
Total claims	18 - 20 =		X \$18.00
Independent claims	1 - 3 =		X \$78.00

MULTIPLE DEPENDENT CLAIM(S) (if applicable) + \$260.00

**TOTAL OF ABOVE CALCULATIONS =**

\$ 970

Reduction of 1/2 for filing by small entity, if applicable. A Small Entity Statement  
must also be filed (Note 37 CFR 1.9, 1.27, 1.28).

\$

**SUBTOTAL =**

\$ 970

Processing fee of \$130.00 for furnishing the English translation later than ☐ 20 ☐ 30  
months from the earliest claimed priority date (37 CFR 1.492(f)).

\$

**TOTAL NATIONAL FEE =**

\$ 970

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be  
accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +

\$

**TOTAL FEES ENCLOSED =**

\$ 970

Amount to be:  
refunded \$  
charged \$

a. ☒ A check in the amount of \$ 970 to cover the above fees is enclosed. (Check No. 15194)

b. ☐ Please charge my Deposit Account No. \_\_\_\_\_ in the amount of \$ \_\_\_\_\_ to cover the above fees.  
A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any  
overpayment to Deposit Account No. 10-1213. A duplicate copy of this sheet is enclosed.

**NOTE:** Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO.

Felix J. D'Ambrosio  
JONES, TULLAR & COOPER, P.C.  
P.O. Box 2266 Eads Station  
Arlington, VA 22202

Date: 21 September 2000



SIGNATURE

Felix J. D'Ambrosio

NAME

25,721

REGISTRATION NUMBER

3838 025 #3

Applicant or Patentee: Werner SOBEK et alApplication or Patent No. : 09/646,101Filed or Issued: September 21, 2000For: UMBRELLA DEVICE

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY  
STATUS (37 CFR 1.9(f) and 1.27(c)) - SMALL BUSINESS CONCERN**

I hereby declare that I am

- the owner of the small business concern identified below:  
☒ an official of the small business concern empowered to act on behalf of the concern  
identified below

NAME OF CONCERN Transsolar Energietechnik GmbHADDRESS OF CONCERN (Nobelstrasse 15, 70569 Stuttgart, Germany)Cuvickstr. 2, 70563 Stuttgart, Germany

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third-party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed, to and remain with the small business concern identified above with regard to the invention, entitled UMBRELLA DEVICE by inventor(s) Werner SOBEK; Mathias SCHULER; and Dominik BAUMÜLLER described in

- the specification filed herewith  
☒ application no. 09/646,101, filed September 21, 2000  
       patent no.                                 , issued

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below\* and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR 1.9(d) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

\*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27).

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_

\_\_\_\_ INDIVIDUAL \_\_\_\_ SMALL BUSINESS CONCERN \_\_\_\_ NONPROFIT ORGANIZATION

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_

\_\_\_\_ INDIVIDUAL \_\_\_\_ SMALL BUSINESS CONCERN \_\_\_\_ NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small business entity is no longer appropriate. (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING X Matthias Schuler  
TITLE OF PERSON OTHER THAN OWNER ✓ Dipl.-Ing.  
ADDRESS OF PERSON SIGNING Carst. 2  
70563 Stuttgart

SIGNATURE

*M. Schuler*

Date

29-11-2000

3838 #3  
02Applicant or Patentee: Werner SOBEK et alApplication or Patent No. : 09/646,101Filed or Issued: September 21, 2000For: UMBRELLA DEVICE

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY  
STATUS (37 CFR 1.9(f) and 1.27(c)) - SMALL BUSINESS CONCERN**

I hereby declare that I am

       the owner of the small business concern identified below:  
  X   an official of the small business concern empowered to act on behalf of the concern  
identified below

NAME OF CONCERN Werner Sobek Ingenieure GmbHADDRESS OF CONCERN Albstrasse 14, 70597 Stuttgart, Germany

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CRF 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third-party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed, to and remain with the small business concern identified above with regard to the invention, entitled UMBRELLA DEVICE by inventor(s) Werner SOBEK; Mathias SCHULER; and Dominik BAUMÜLLER described in

       the specification filed herewith  
  X   application no. 09/646,101, filed September 21, 2000  
       patent no.                     , issued

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below\* and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR 1.9(d) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

\*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27).

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_

\_\_\_\_ INDIVIDUAL \_\_\_\_ SMALL BUSINESS CONCERN \_\_\_\_ NONPROFIT ORGANIZATION

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_

\_\_\_\_ INDIVIDUAL \_\_\_\_ SMALL BUSINESS CONCERN \_\_\_\_ NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small business entity is no longer appropriate. (37 CFR 1.28(b)).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING WERNER SUBEK  
TITLE OF PERSON OTHER THAN OWNER PROF. DR.  
ADDRESS SOF PERSON SIGNING ALSTR. 14, 70597 STUTTGART / GERMANY

SIGNATURE 

Date 5.12.2000

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of )  
 )  
 Werner SOBEK et al )  
 )  
 Appln. No. : TBA )  
 )  
 Filed : September 21, 2000 )  
 )  
 For : UMBRELLA DEVICE )

**PRELIMINARY AMENDMENT**

Honorable Commissioner of Patents and Trademarks  
 Washington, D.C. 20231

Sir:

Prior to an examination on the merits, please amend this application as follows:

**AMENDMENTS****IN THE SPECIFICATION:**

Page 1, line 2, change "Specification" to

--Field of the Invention--;

line 3, change "in" to --having a shank and an umbrella-like cap which can  
 rotate around the shank and opened up--;

line 4, delete "accordance with the preamble of claim 1";

between lines 4 and 5, insert

--Background of the Invention--;

line 7, change "the" (second occurrence) to --a--;

line 15, delete "used as strain";

line 16, between "rods" and "has" insert --produces strain--;

line 17, between "areas" and "and" insert a --,--;

line 20, change "in accordance with the preamble of claim" to --having a shank and an umbrella-like cap which can rotate around the shank and opened up--;

line 21, delete "1", change "-A-" to --Patent No.--, and between "from" and "EP" insert --European Patent No.--; and

line 25, change "in" to --with--.

Page 2, between lines 3 and 4, insert

--Summary of the Invention--;

line 4, change "create" to --provide--;

lines 8 and 9, delete in their entirety, and insert

--According to the present invention, the umbrella-like cap can be motor driven and includes a membrane of low flexural strength, but with tensile strength. The membrane has a circular base surface which can be erected by means of centrifugal forces resulting from the rotation from a position of rest, where it droops limply around the shank to an opened, essentially horizontal position.--;

line 12, before "invention" insert --present--;

line 18, change "the characteristics of claim 2 or claim 3" to --fixing the shank at the head of the shank against relative rotation, and the use of an electric motor--;

line 22, change "characteristics in accordance with claim 6 are provided" to --energy supply for the motor drive is received in the shank--;

line 26, change "characteristics in accordance with claim 7 can be" to



--membrane can have a pagoda-shaped cut-out shape, matched to the specific influencing variables--;

line 28, delete "in accordance"; and

line 29, change "with the characteristic of claim 8" to --can include ballast which--.

Page 3, line 1, change "The characteristics in accordance with claim 9 are" to --Providing the membrane with radially and/or annularly arranged cords is--;

line 3, change "Embodiments" to --Favorable embodiments--, and delete "the";

line 4, change "characteristics of claims 10 and/or 11" to --a membrane provided with additional masses on the outer circumference of the membrane, such as a cord at the edge, individual weights, doubling of the membrane, or the like--;

line 7, change ", if the characteristics of one or several" to --from a membrane having a flat, pillow-like shape, which may be divided into radially and/or annularly arranged air chambers connected with a blower, or a pneumatic drive, from having the inside of the membrane, which is at rest, charged with compressed air, and from providing the shank with outlet openings in the area of the membrane when at rest.--;

line 8, delete in its entirety;

line 9, between "the" and "invention" insert --present--;

line 10, between "the" and "invention" insert --present--;

line 12, delete "Shown are in:";

between lines 12 and 13, insert

--Brief Description of the Drawings--;

line 13, between the "," and "an" insert --illustrate--;

line 17, between the "," and "the" insert --illustrates--;

line 19, between the "," and "a" insert --illustrates--;

line 21, between the "," and "representations" insert --illustrate--;

line 25, between the "," and "a" insert --illustrates--;

line 27, between the "," and "a" insert --illustrates--; and

line 29, between the "," and "still" insert --illustrates--.

Page 4, before line 1, insert

--Description of the Preferred Embodiments--; and

line 22, change "in" to --with--.

Page 6, line 8, delete "said".

Page 7, line 23, delete "said".

IN THE CLAIMS:

Please cancel claims 1-17 without prejudice or disclaimer of the subject matter thereof.

Please add the following new claims:

18. An umbrella device, comprising:

a shank;

an umbrella-like cap connected to said shank, said umbrella-like cap comprising a membrane having tensile strength and low flexural strength, and a circular base surface; and

driving means for driving said membrane, wherein said membrane defining a position of rest, wherein it droops limply around said shank, and an opened position, wherein it assumes an essentially horizontal position, said membrane assuming said opened position under the influence of centrifugal force generated due to the rotation of said membrane by said driving means.

19. The umbrella device in accordance with claim 18, wherein said driving means comprises an electric motor.

20. The umbrella device in accordance with claim 18, wherein said shank defines a head and said driving means is located at the head of said shank, and wherein said shank is fixed against relative rotation.

21. The umbrella device in accordance with claim 20, wherein said driving means comprises an electric motor.

22. The umbrella device in accordance with claim 18, further comprising:

means for clamping said membrane to said shank, said means for clamping comprising two disks fixed against relative rotation with respect to said driving means.

23. The umbrella device in accordance with claim 18, wherein said driving means comprises a pneumatic drive.

24. The umbrella device in accordance with claim 18, wherein the energy supply for said driving means is received in said shank.

25. The umbrella device in accordance with claim 18, wherein said membrane has a pagoda-shaped cut-out shape, matched to specific influencing variables.

26. The umbrella device in accordance with claim 18, further comprising:

ballasting, and wherein said membrane is provided with said ballasting.

27. The umbrella device in accordance with claim 26, wherein said membrane is provided with one of: radially, annularly, and radially and annularly arranged cords as said ballasting.

28. The umbrella device in accordance with claim 26, wherein said membrane is provided with additional masses as ballasting on its outer circumference in accordance with one of: a cord at the edge, individual weights, and doubling of said membrane.

29. The umbrella device in accordance with claim 18, wherein said membrane has a double-layered shape in cross section.

30. The umbrella device in accordance with claim 18, wherein said membrane has a flat, pillow-like shape.

31. The umbrella device in accordance with claim 30, wherein said pillow-like membrane is divided into one of: radially, annularly, and radially and annularly arranged air chambers.

32. The umbrella device in accordance with claim 31, further comprising:

a blower, and wherein said air chambers are connected with said blower.

33. The umbrella device in accordance with claim 32, wherein said air chambers are connected with said driving means, and wherein said driving means comprises a pneumatic device.

34. The umbrella device in accordance with claim 18, wherein in the rest position said membrane can be charged with compressed air.


35. The umbrella device in accordance with claim 18, wherein said shank has air outlet openings located in the area of said membrane which is in the rest position.

REMARKS

The above amendments are being submitted to place this application in better condition for examination.

Submitted herewith is page 11 of the application containing an abstract of the disclosure.

Respectfully submitted,

  
Felix J. D'Ambrósio  
Reg. No. 25,721

September 21, 2000

JONES, TULLAR & COOPER, P.C.  
P.O. Box 2266 Eads Station  
Arlington, VA 22202  
(703) 415-1500

### Abstract of the Disclosure

An umbrella device which has a shank, an umbrella-like cap formed as a membrane and a driver. The membrane is connected to the shank and is caused by the driver to move from a position of rest where it droops limply around the shank to an open position where it is essentially horizontal due to the centrifugal forces of the membrane produced by the rotation of the membrane by the driver.

12/pts

09/646101  
430 Rec'd PCT/PTO 21 SEP 2000

WO 99/48399

PCT/EP99/01668

Title: Umbrella Device

### Specification

The present invention relates to an umbrella device in accordance with the preamble of claim 1.

Umbrella devices in the form of umbrellas and parasols are known, whose umbrella-like cap is provided with ribs, one end of which is linked to a ring arranged at the upper end of the shank and the other end at a sleeve, which can be displaced and fixed in place along the shank for spreading the umbrella cap.

These ribs are required for supporting the cover material used as the covering. In case of umbrella devices of larger dimension, the ribs already constitute a large proportion of the dead weight of the umbrella device. With a filigreed weight-reducing design they are prone to buckling when strained by wind. The controlled folding up of the cover material used as strain and of the rods has been shown to be technically difficult with umbrella devices of large surface areas and poses the danger of damage to the thin cover material of low flexural strength in the contact points between the cover and the ribs.

An umbrella device in accordance with the preamble of claim 1 is known, for example, from US-A-5 020 557 and from EP-A 0 382 122. In the first case, the umbrella-like cap is rotatingly held for absorbing and compensating wind forces. In the second case, the umbrella-like cap has two elements arranged on top of each other, wherein the upper cap element can be manually rotated in respect to the lower, fixed-in-place cap element by preselected degrees of angle for filtering out undesirable sunlight components. Such umbrella devices with a manually rotatable cap

are relatively expensive to produce and elaborate in use, since they can be opened up only over provided ribs, which moreover have a considerable weight.

It is the object of the present invention to create an umbrella device of the type mentioned at the outset which, while avoiding the above mentioned disadvantages, can be opened up and folded again in a simpler, and in particular automatic way.

The characteristics mentioned in claim 1 are provided for attaining this object.

A light-weight umbrella device which can be automatically opened up is created by means of the steps in accordance with the invention, which can be mechanically simplified and can be produced with a large area in particular. The umbrella device moreover provides an active ventilation of the space underneath the umbrella-like cap.

A preferred arrangement of the motor drive and of the holder of the membrane on the power take-off shaft results from the characteristics of claim 2 or claim 3.

In a preferred manner, the motor drive can be realized either by means of an electric motor of small dimensions, a pneumatic or also a hydraulic drive mechanism. The characteristics in accordance with claim 6 are provided for achieving a weather protection for it and/or to avoid spoiling the appearance. As an energy supply for a pneumatic drive mechanism, the shank itself can constitute the air-conducting tube.

The characteristics in accordance with claim 7 can be suitably employed for improving the aerodynamic stability of the umbrella device. For example, a shape of the cap in accordance with the characteristic of claim 8 can be useful.



The characteristics in accordance with claim 9 are also advantageous for improving the aerodynamic stability of the umbrella device. Embodiments thereof ensue from the characteristics of claims 10 and/or 11.

A further option for improving the aerodynamic stability and/or the unfolding process of the umbrella-like cap of the umbrella device results, if the characteristics of one or several of claims 12 to 17 are provided.

Further details of the invention can be taken from the description which follows, in which the invention is described in greater detail and explained by means of the exemplary embodiments represented in the drawings. Shown are in:

Figs. 1A and 1B, an umbrella device in accordance with a preferred exemplary embodiment of the present invention in an opened-up operating position in a schematic perspective view or a schematic lateral view,

Fig. 2, the umbrella device in accordance with Fig. 1 in a schematic lateral view, but in the folded-up position of rest,

Fig. 3, a representation corresponding to Fig. 1B, but in accordance with a second embodiment of the present invention,

Figs. 4A, B to 8A, B, representations corresponding to Fig. 1A, or partial enlargements in accordance with the circles IV to VIII, but in accordance with further exemplary embodiments of the present invention,

Fig. 9, a representation of a further embodiment corresponding to Fig. 1B,

Fig. 10, a representation of a further embodiment corresponding to Fig. 1B,

Fig. 11, still another embodiment of the present invention during the opening-up process in a schematic lateral view.

The umbrella device 10, 110 or 210 represented in the drawings has a ribless, umbrella-like cap 11, 111 or 211, which is rotatably maintained at the upper end of a shank 12, 112 or 212 and can be rotatably driven in such a way, that the umbrella-like cap 11 can be opened-up from a drooping, limp position of rest into an umbrella-like operating position, can be maintained opened up and stabilized by the centrifugal force resulting from its rotation.

In accordance with Fig. 1B, the upwardly extending shank 12 is maintained fixed in place, for example fastened underneath the bottom surface 13 on a block 14. A motor drive 15 is fastened or flanged at the upper end of the shank 12, whose vertically upwardly projecting drive shaft 16 is connected, fixed against relative rotation, with a lower disk 17 which, together with an oppositely located upper disk 18 is a part of a fastening device 19 for the cap 11.

The umbrella-like cap 11 essentially consists of a membrane 21 made of a light material of low flexural strength, but having tensile strength. The membrane 21 has a circular base surface and is fastened around its center between the two disks 17 and 18 of the fastening device 19, wherein the two disks 17 and 18 are typically arranged centered in respect to the circular peripheral edge 22 of the membrane 21. Maintaining the membrane 21 on the fastening device 19 can be provided in a manner not represented, for example by clamping the two disks 17, 18 against each other.

In the position of rest represented in Fig. 2, the membrane 21 is arranged around the shank 12, limply drooping down from the fastening device 19. It should be understood that the ratio between the membrane diameter and the shank length can be selected in accordance with conventional umbrellas or parasols. If the

motor drive 15 which, in the exemplary embodiment represented here is an electric motor drive, is switched on, the membrane 21 is caused to rotate, for example in the direction A (Fig. 1A), because of which the membrane 21 is raised in the direction of the arrows B because of the centrifugal forces acting on it, until it has attained the opened-up, here approximately horizontal operating position, represented in Figs. 1A and 1B. In this operating position, the rotation (arrows A) of the membrane 21 lasts as long as the umbrella-like cap 11 is intended to be kept opened up. The required size of the rotating speed is a function of various factors, such as weight, exterior effects, and the diameter of the membrane 21, as well as the amount of the possible additional ballasting. To fold the membrane 21 into the position of rest or parked position in accordance with Fig. 2, the motor drive 15 is switched off or the speed of rotation is steadily reduced.

The embodiment in accordance with Fig. 3 shows an umbrella device 10a with a pagoda-shaped cut-out shape of the umbrella cap 11a matched to the specific influencing variables.

Figs. 4 to 8 show embodiments of umbrella devices 10b to 10f, whose umbrella-like caps 11b to 11f or membranes 21b to 21f are equipped with ballasting 30 of different kinds. In accordance with Fig. 4, the membrane 21b is provided with annular cords 31 which, in accordance with Fig. 4B are covered and held by a strip 36 made, for example, from the material of the membrane.

Fig. 5 shows ballasting 30 in the form of radial cords 32, which are maintained on the top or the underside of the membrane 21c, for example also by means of strips 37.

Fig. 6 shows an edge cord 33 as ballasting, which is held in an edge seam 38 of the membrane 21d.

In the embodiment in Fig. 7, the ballasting 30 is formed by individual masses 34, which are fastened in an evenly distributed arrangement on the outer edge 29 of the membrane 21e.

Finally, Fig. 8 shows ballasting 30 at the peripheral edge, for example by means of an annular doubling 35 of the material of the membrane 21f.

An improvement of the aerodynamic stability and the opening process when the rotating process is started results from the said ballasting.

The embodiment in accordance with Fig. 9 shows an umbrella device 10a' with a double-layered cap 11a', whose upper, 25, and lower layer 26 are each maintained at an upper, 19a, and lower fastening device 19b.

The umbrella device 110 represented in Fig. 10 has a cap 111, wherein the membrane 121 is embodied as a flat cushion with an upper membrane layer 41 and a lower membrane layer 42, which are connected along the outer edge. The two membrane layers 41 and 42 are divided into individual chambers 44 by means of intermediate walls 43. In the exemplary embodiment, the radial and/or ring-shaped chambers 44 are filled with air, wherein the interior pressure to be built up in the chambers 44 can be provided in different ways during start-up and during rotation in the operating position. For this purpose, the membrane 121 or its chambers 44 are connected in a manner not represented with a blower. The interior pressure built up in the chambers 44 can also be temporarily limited in the operating phase. It is for example possible to increase the interior pressure during the duration of external effects, such as increased wind strain, and to reduce it during phases of reduced effects, or even to evacuate the chambers 44.

In the umbrella device 210 represented in Fig. 11, the shank 212 is provided with outlet openings 46 in its upper area covered by the membrane 212 in the position of rest, which are arranged in the wall of the hollow shank 212, for example distributed over the circumference and at several heights. The hollow shank 212 is connected with a blower 47. The compressed air generated by the blower 47 is conducted through the hollow shank 212 and can exit through the outlet openings 46. It is possible by means of this compressed air flow 48 to effectively aid the opening process of the membrane 221, which here has the shape of the membrane 21 in accordance with Figs. 1 and 2, during the rotation of the membrane 221 (arrow A). After having attained the operating position of the membrane 221, the blower 47 can be switched off.

While the motor drive 15 is represented as an electric motor in the exemplary embodiments shown in the drawings, whose electrical feed line can be conducted through the hollow shank 12, 112, 212, it is provided in accordance with an embodiment not represented to design the motor drive 15 as a pneumatic drive. It is possible to use the blower 47 in accordance with Fig. 10 for this, in which the underside of the fastening device 19 is embodied in the form of a wind wheel, for example. With this arrangement the said outlet openings 46 are designed to be closable. It should be understood that such a pneumatic drive mechanism can also be advantageous in connection with the exemplary embodiment in Fig. 10.

## Claims

1. An umbrella device (10, 110, 210) with a shank (12, 112, 212) and an umbrella-like cap (11, 111, 211), which can rotate around the shank and can be opened up, characterized in that the umbrella-like cap (11, 111, 211) can be motor-driven and is constituted by a membrane (21, 121, 221) of low flexural strength, but having tensile strength, with a circular base surface, which can be erected by means of centrifugal forces, resulting from the rotation, from a position of rest, wherein it droops limply around the shank (12, 112, 212), and opened into an essentially horizontal position.

2. The umbrella device in accordance with claim 1, characterized by a motor drive (15) at the head of the shank (12, 112, 212), which shank is fixed against relative rotation.

4. The umbrella device in accordance with at least one of claim 1 to 3, characterized in that the drive (15) is constituted by an electric motor.

4. The umbrella device in accordance with claims 1 and 2, characterized in that the membrane (21, 121, 221) is maintained, preferably clamped, by means of two disks (17, 18), which are coupled, fixed against relative rotation, with the shaft (16) of the motor drive (15).

5. The umbrella device in accordance with at least one of claim 1 to 3, characterized in that a pneumatic drive is provided.

6. The umbrella device in accordance with at least one of the preceding claims, characterized in that the energy supply for the motor drive (15) is received in the shank (12, 112, 212).

7. The umbrella device in accordance with at least one of the preceding claims, characterized in that the membrane (21) has a pagoda-shaped cut-out shape, matched to the specific influencing variables.

8. The umbrella device in accordance with at least one of the preceding claims, characterized in that the membrane (21) is provided with ballasting (30).

9. The umbrella device in accordance with claim 8, characterized in that the membrane (21) is provided with radially and/or annularly arranged cords (31, 32).

10. The umbrella device in accordance with claim 8 or 9, characterized in that the membrane (21) is provided with additional masses on the outer circumference, such as a cord at the edge, individual weights, doublings of the membrane, or the like.

11. The umbrella device in accordance with at least one of the preceding claims, characterized in that the membrane (21) has a double-layered shape in cross section.

12. The umbrella device in accordance with at least one of the preceding claims, characterized in that the membrane (121) has a flat, pillow-like shape.

13. The umbrella device in accordance with claim 12, characterized in that the pillow-like membrane (121) is divided into radially and/or annularly arranged air chambers (44).

14. The umbrella device in accordance with claim 13, characterized in that the air chambers (44) are connected with a blower.

15. The umbrella device in accordance with claims 14 and 5, characterized in that the air chambers (44) are connected with a pneumatic drive (15).

16. The umbrella device in accordance with at least one of the preceding claims, characterized in that the inside of the membrane (221), which is in the position of rest, can be charged with compressed air.

17. The umbrella device in accordance with claims 16 and 5 or 6, characterized in that the shank (212) is provided with air outlet openings (46) in the area of the membrane (221), which is in the position of rest.



Fig. 1A

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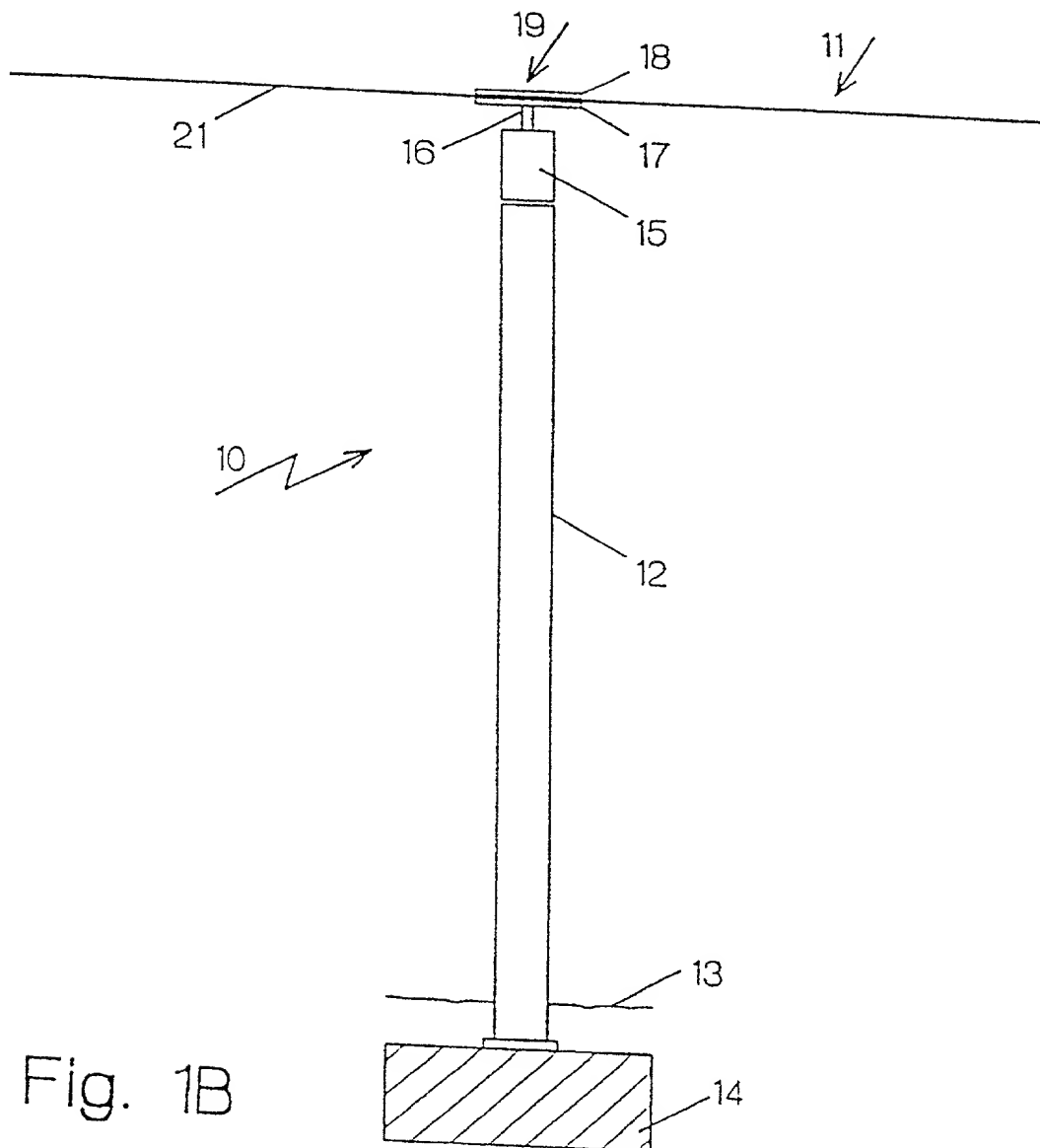


Fig. 1B

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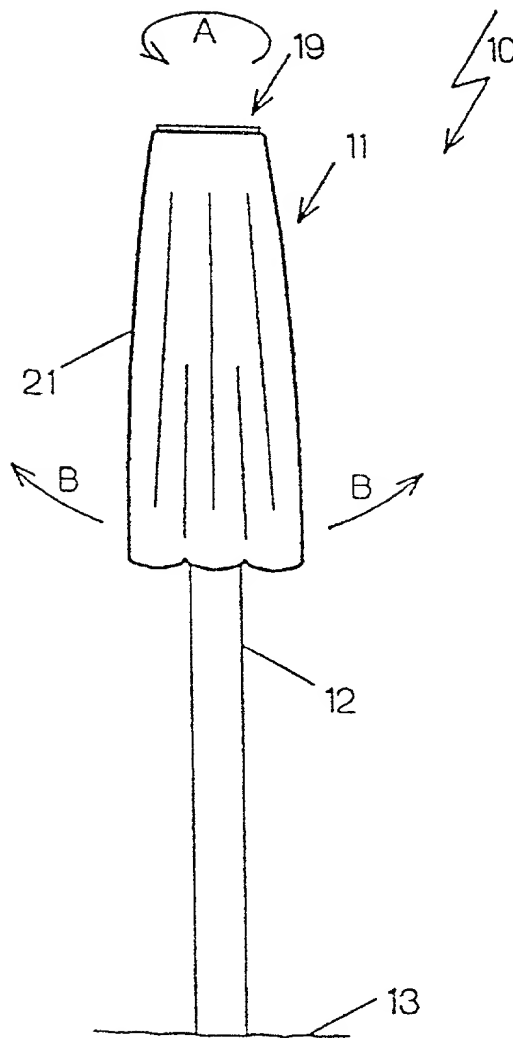


Fig. 2

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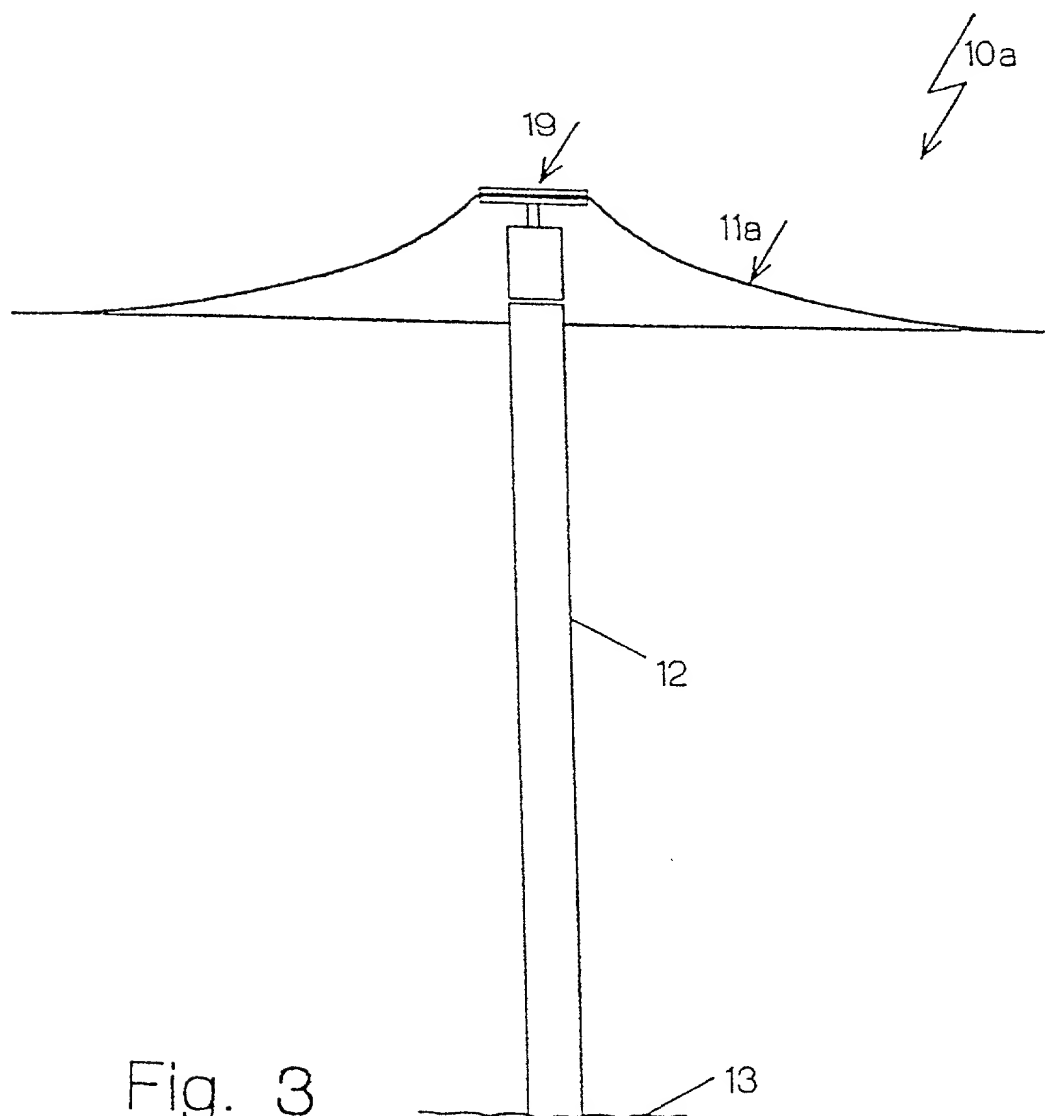
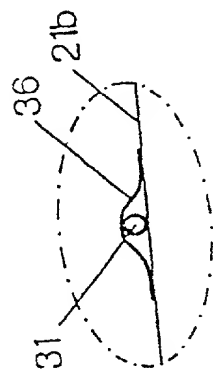
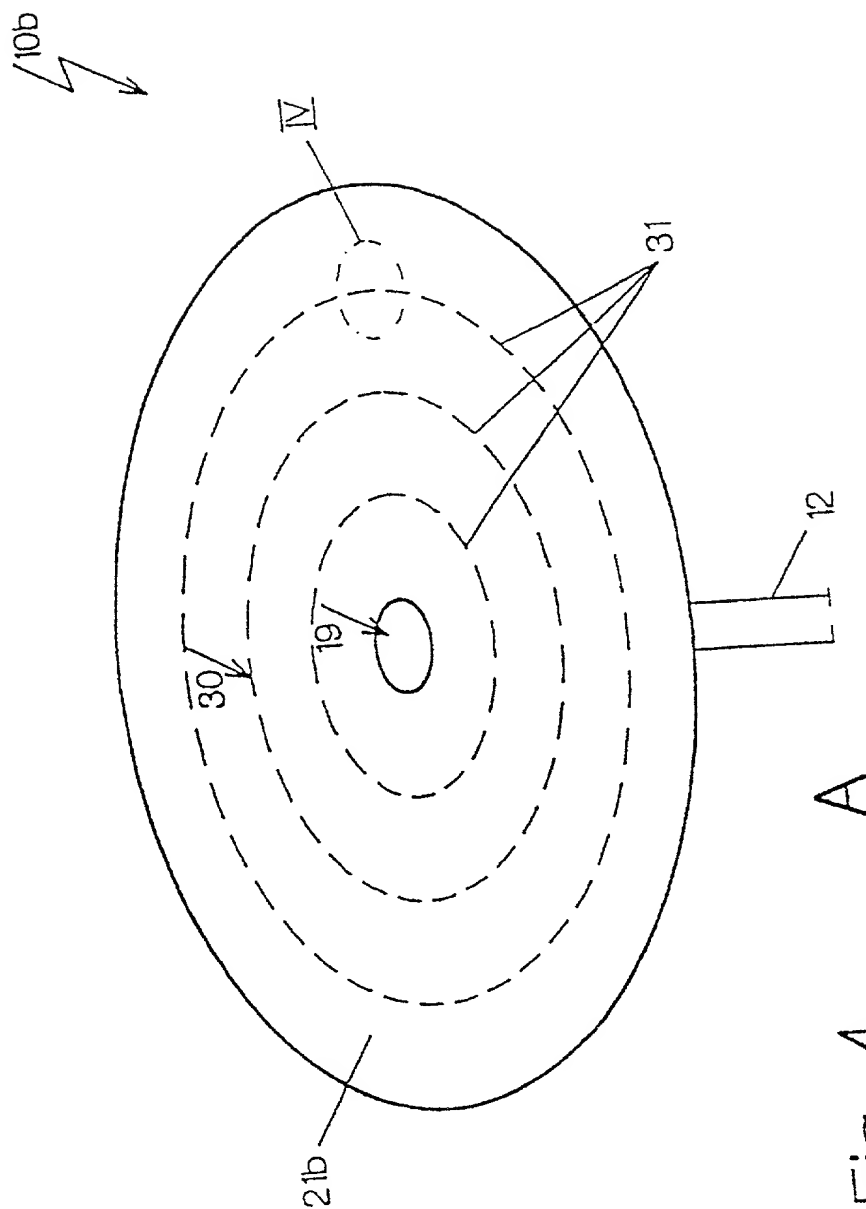
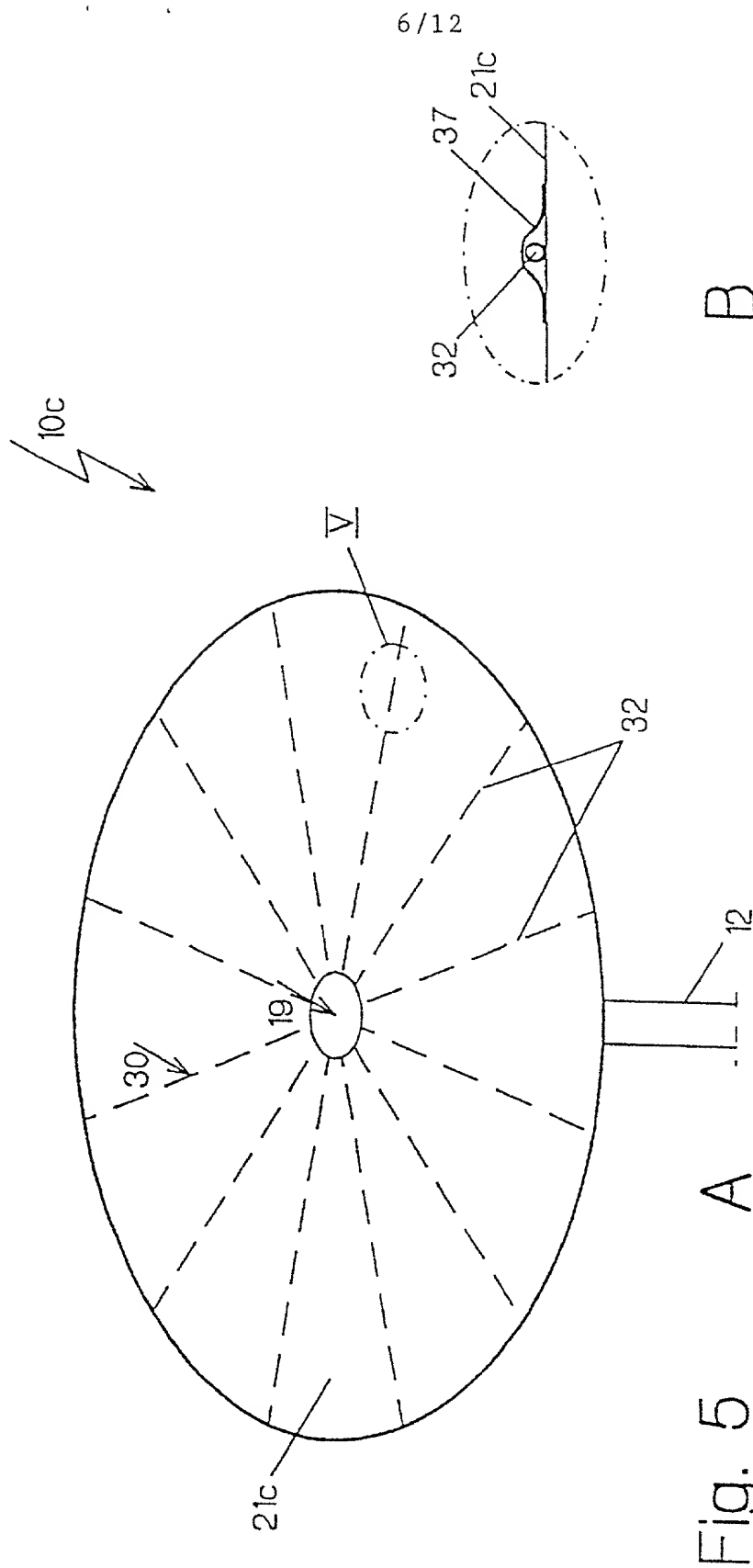


Fig. 3

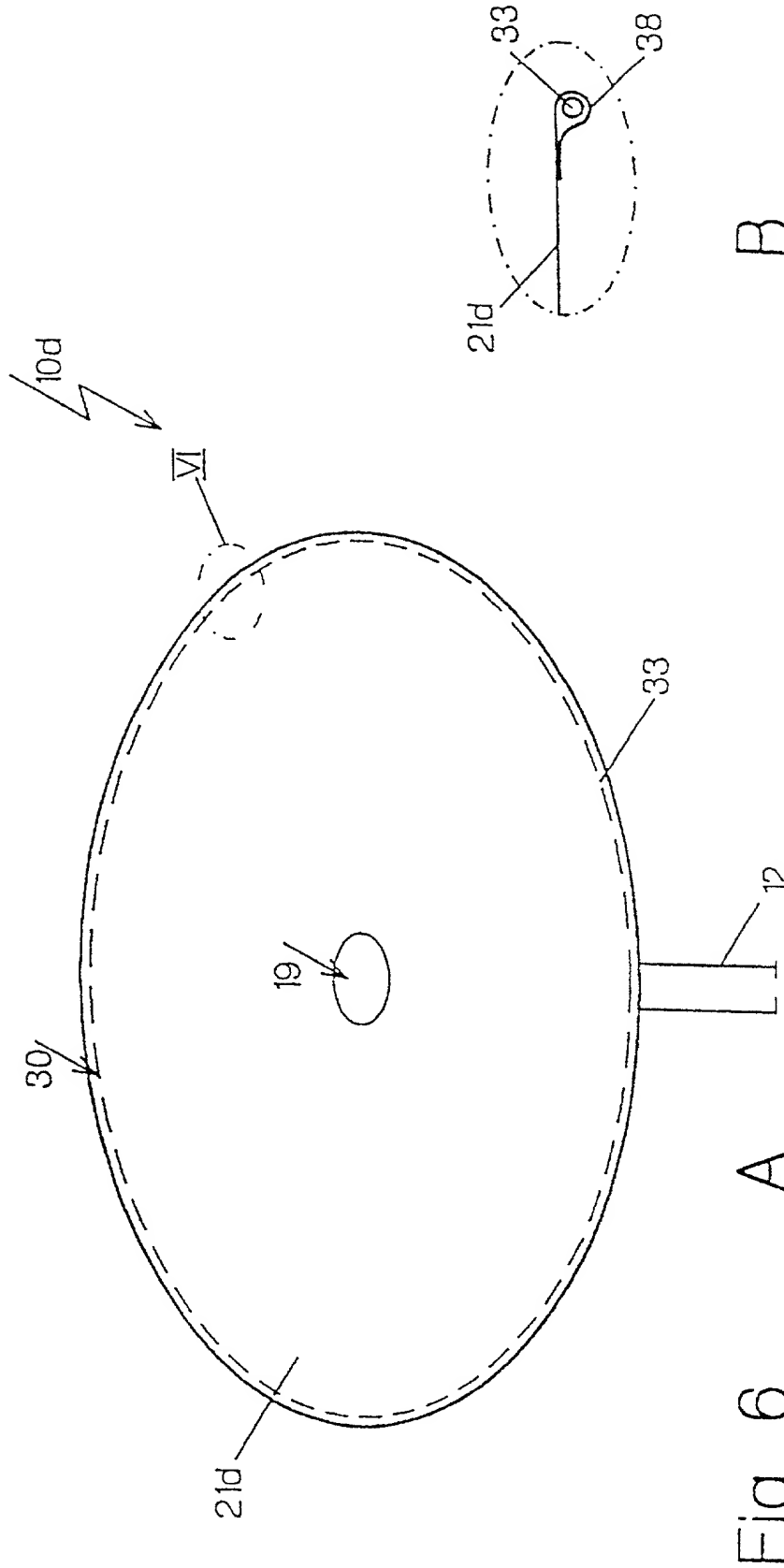


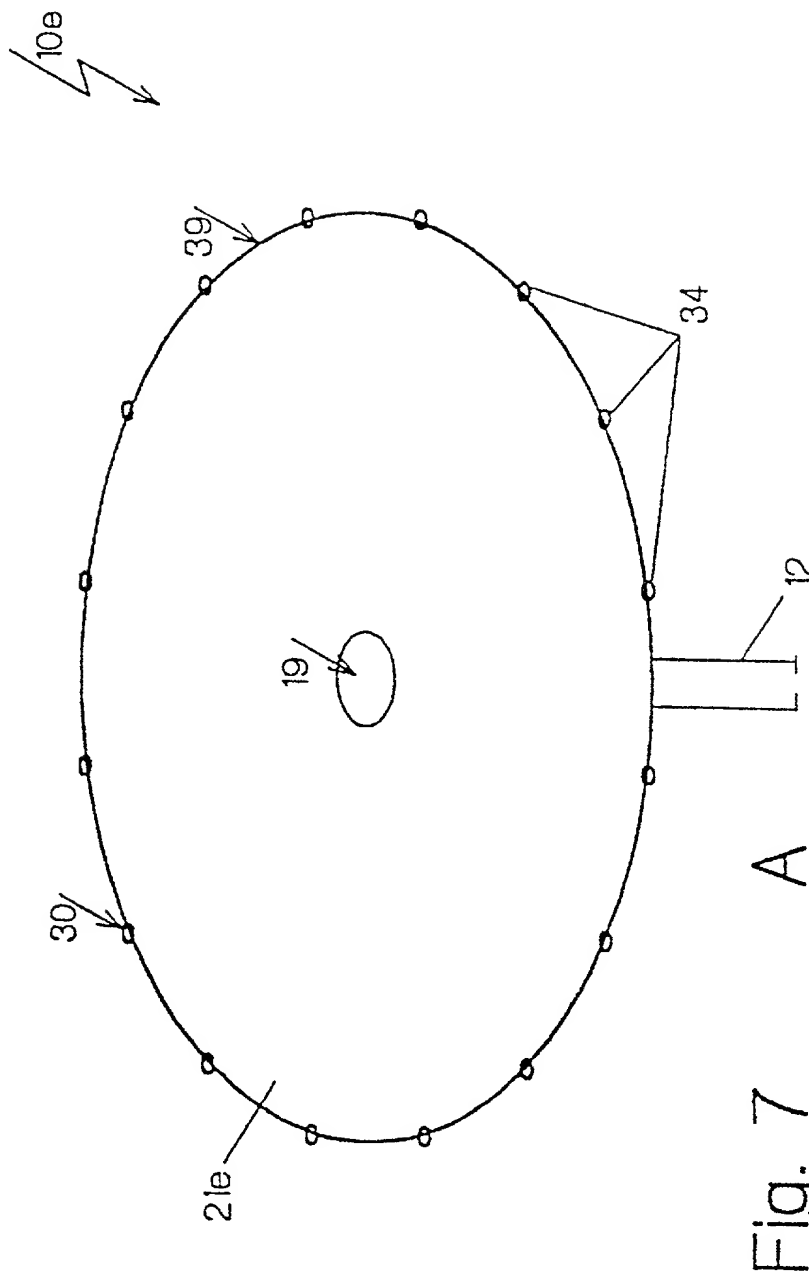


A

Fig. 5

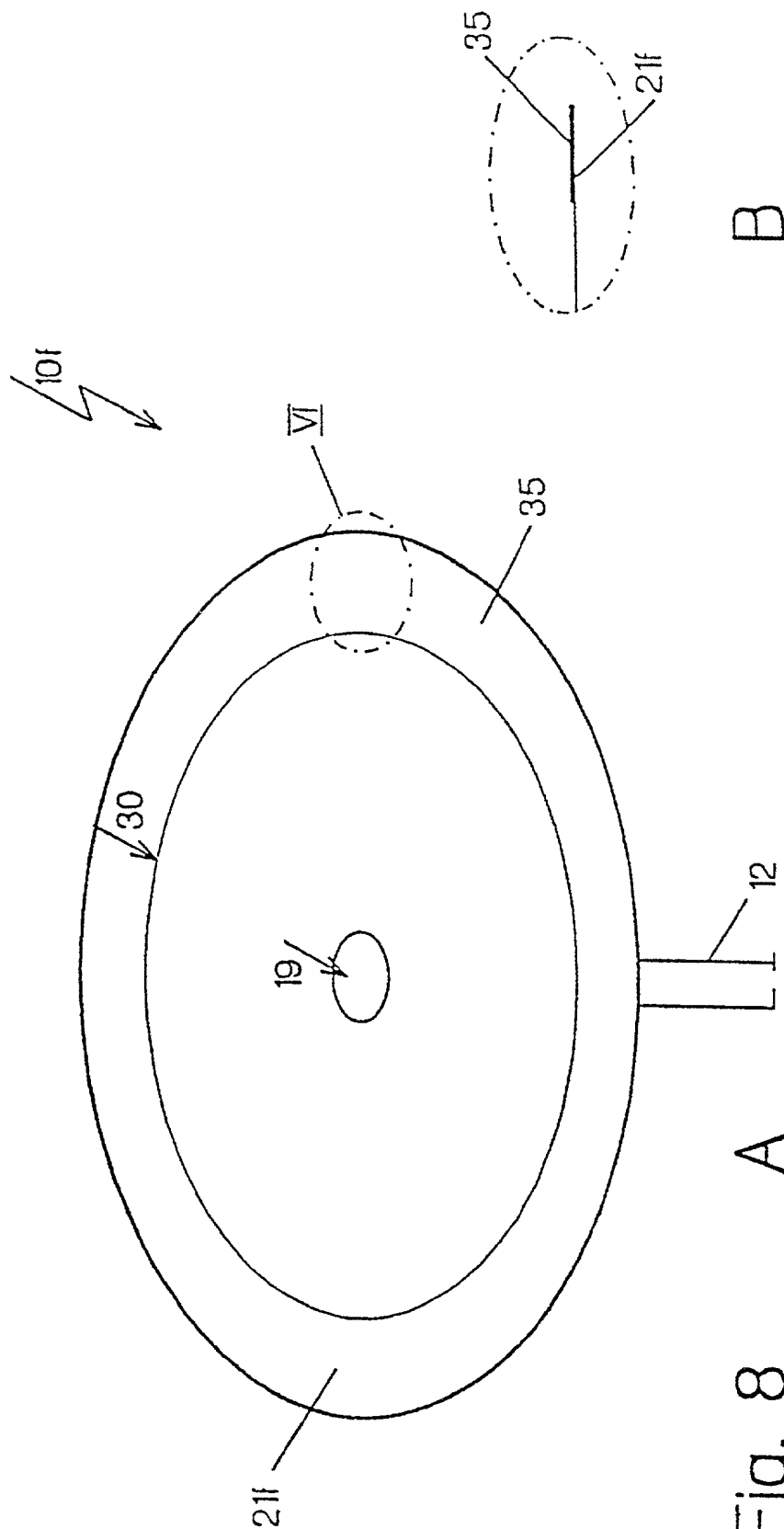
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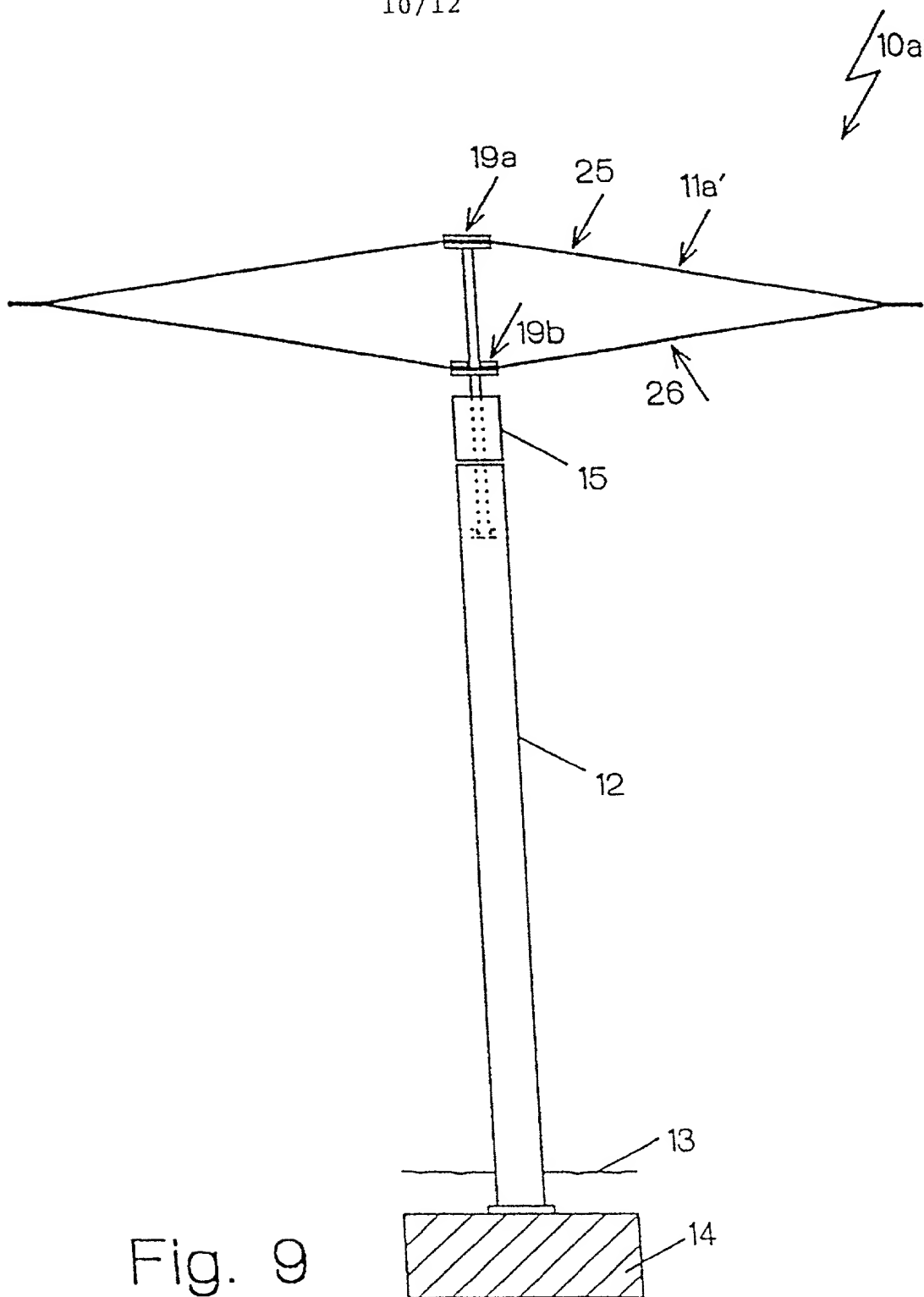


Fig. 9

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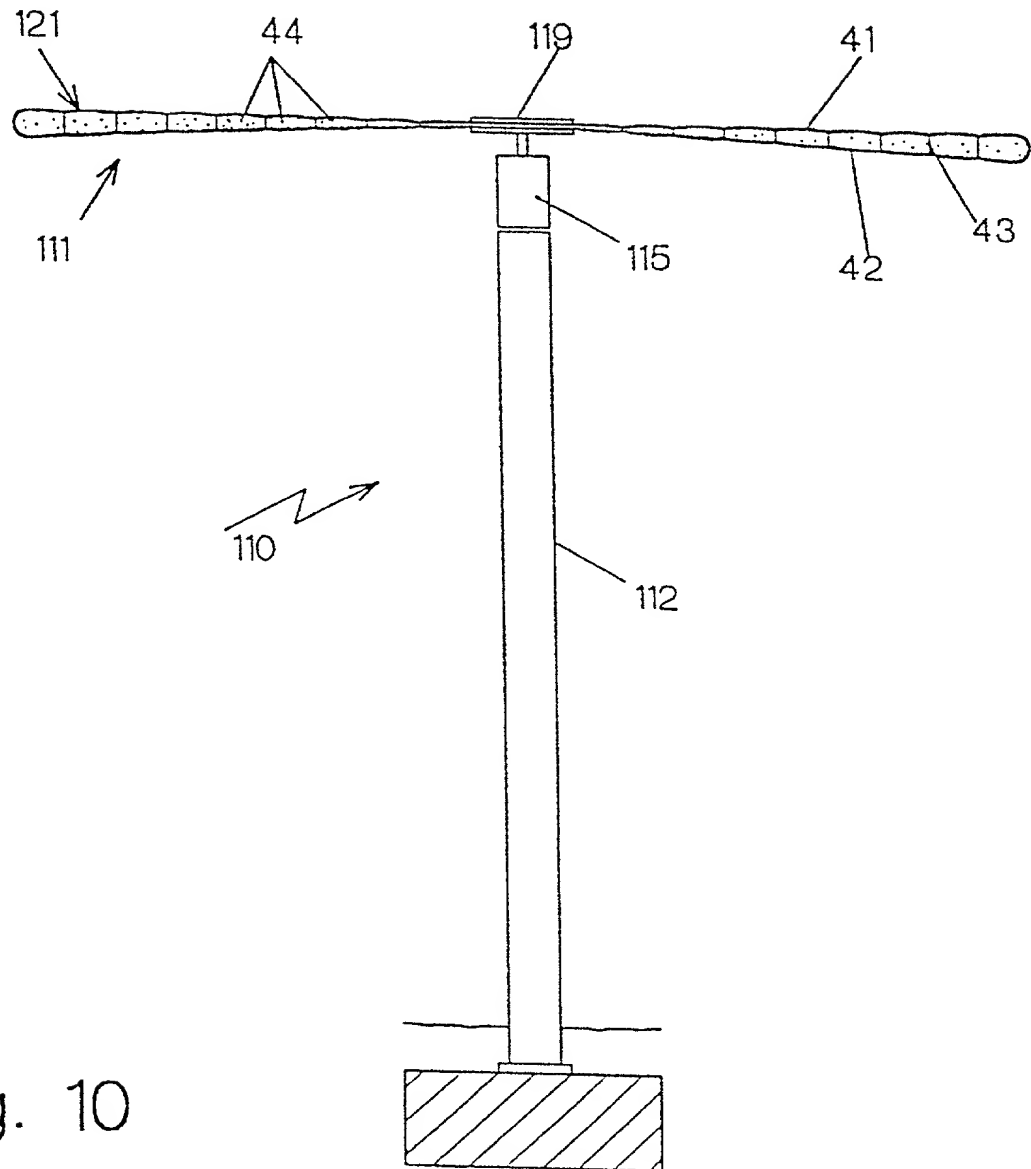


Fig. 10

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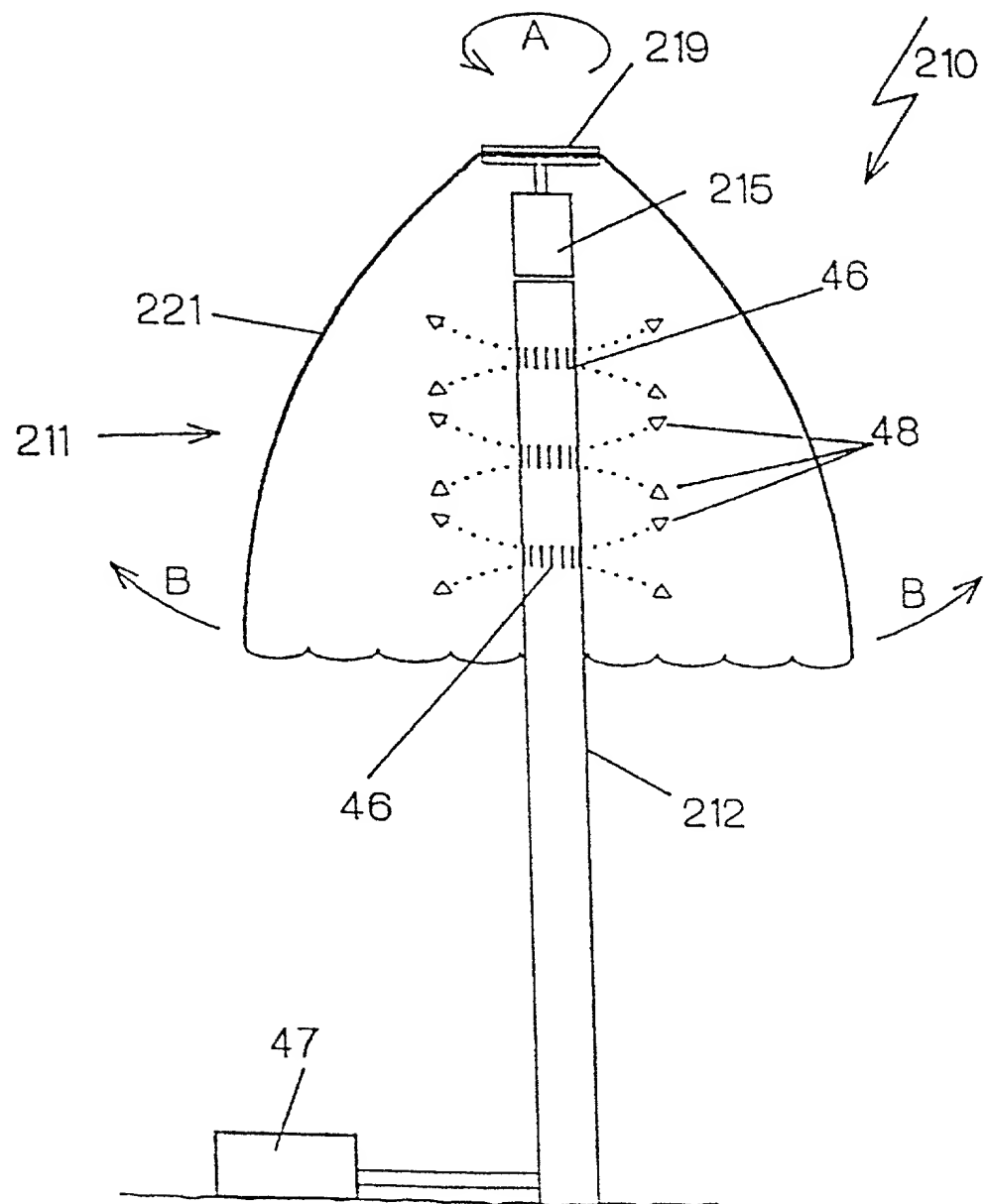


Fig. 11

3838 025

**COMBINED DECLARATION AND POWER OF ATTORNEY**

As a below named inventor, I hereby declare that:

This declaration is of the following type:

- ☐ original
- ☐ design
- ☐ supplemental
- ☒ national stage of PCT
- ☐ divisional
- ☐ continuation
- ☐ continuation-in-part (CIP)

My residence, post office address and citizenship are as stated next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed for and for which a patent is sought on the invention entitled:

**UMBRELLA DEVICE**

the specification of which

- ☐ is attached hereto
- ☒ was filed on 21 September 2000, as  
Application No. 09/646,101  
and was amended on \_\_\_\_\_  
(if applicable)
- ☒ was described and claimed in PCT International application  
No. PCT/EP99/01668 filed on 13 March 1999  
and as amended under PCT Article 19 on \_\_\_\_\_  
(if any).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any Amendment referred to above.

I acknowledge duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Sec. 1.56.

☐ In compliance with this duty there is attached an information disclosure statement. 37 CFR 1.97.

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